A Preliminary Study of Merchants' Intention to Adopt Online Payment Gateway in Indonesia

Nathalia Devina Widjaja and Ardy Tedjawidjaja

Abstract—**The goal of this research is to identify factors that will affect the merchants' intention to adopt online payment gateway in Indonesia. The research is done quantitatively and the data collection method being used is survey or questionnaire. The research finds out that there are 5 out of 6 factors that will affect the merchants' intention to adopt online payment gateway in Indonesia. The factors ordered from the most importance are: Performance Expectancy, Social Influence, Facilitating Condition, Effort Expectancy, and Security. However, Costs is rejected from the research findings. Moreover, further research should be conducted in order to examine other factors related with merchants' intention. It is recommended for online payment gateway providers in Indonesia to attract the merchants by improving the systems, social influence activities, facilitation, and secure environments. Finally, this research has enlightened and enhanced our knowledge of current situation of e-commerce especially online payment gateway in Indonesia.**

Index Terms—**Online payment gateway, payment system, merchants' intention, unified theory of acceptance and use of technology.**

I. Introduction

Indonesia is one of country that has big potential in e-commerce era. Indonesia began their internet era in 1994 when the first internet provider launched which named Indonet. A decade later, total internet services providers (ISP) in Indonesia were increased dramatically become 228 ISP [1]. In e-commerce, Bhinneka.com became pioneer for e-commerce website in Indonesia. After bhinneka.com was launched, several e-commerce website followed the success. For instance, there are Berniaga.com, Tokobagus.com, and Plasa.com. Furthermore, in last few years, there are many e-commerce firm models that developed their own business model. From electronic group coupon (i.e. disdus.com), airlines firms (i.e. Garuda Airlines), electronic marketplace (i.e. Rakuten.co.id, Blibli.com, and Kemana.com), and other firms that provide goods and services.

Although the development of e-commerce in Indonesia was great in recent years, there are some problems for operating e-commerce industry. According to the recent survey that was conducted by DS Research, there are only 38% from total respondent was comparing and buying the products online [2]. The other respondent used e-commerce website just for comparing the price and buy offline. Payment method is believed as one from many reasons why people are not buying products via online [3]. Based on the previous survey, majority of the payment method that is used by customers in transfer base method, whether payment gateway such as PayPal is the least way to do online payment method [2]. However, in other country like USA, Japan, and China payment gateway is the most popular way for merchant and user to do payment transaction online rather than conventional payment like transfer.

There are many payment gateways were established in Indonesia. For instance, there are Doku (previously name NsiaPay), Ipaymu, and Unik. Unhappily, this kind of payment gateways is still inferior if compared with other payment methods both conventional method like transfer based and modern method which are provided by KlikBca and Mandiri.

The reasons of payment gateways are still inferior because the merchants still have low intention towards the adoption of payment gateway as their payment method. Going deeper, it also could be low intention due to local payment gateways had introduced only for a year ago in Indonesia. The development of payment gateways in Indonesia might be better if the payment gateway providers can fulfill the needs of merchants about some aspects such as performance, effort, social, facilitation, costs, security and other matter that influence payment gateways providers to serve online payment system in Indonesia. Moreover, not only the payment gateway providers should comply with requirement by merchant, but also Indonesian government should take actions in order to protect and comfort the e-commerce industry in Indonesia. As it is believed, Indonesian e-commerce industry will have a huge opportunity in the future.

It can be clearly seen that in Indonesia payment system is one of the major problems that e-commerce industry should be faced. As the result of this burden, the emergence of e-commerce website in Indonesia is impeded. Based on article from the famous Indonesian newsfeed in technology, Dailysocial.net, years 2011- 2012 is believed as the years of emergence of payment gateway in Indonesia [4]. In 2011, there are some local payment gateways that were established in Indonesia. Namely, there are Doku, Ipaymu, and Unik. Although there are some payment gateway was established, there are still many merchants do not utilized this offer. Therefore, we believe that the preliminary study of merchants' intention toward the use of payment gateway in Indonesia should be conducted in order to know what kind of factors may influence merchants to intent to use the payment system which is provided by payment gateway providers. Moreover, many e-commerce website still utilize

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conventional payment method such as transfer based as their payment system.

In this research, we will examine and analyze what are the factors that influence Indonesian merchants to intent to use the payment gateway as their payment system in their website. In order to determine the aspects for intention, The Unified Theory of Acceptance and Use of Technology (UTAUT) will be used as the framework theory with four determinants. Other factors that may affect the decision factors regarding intention online payment in Indonesia are costs and security. The explanation why both costs and security have been added as determinants in this paper will be explained in the literature review. We believe that those determinants can depict factors of intention to use of online payment gateway by merchants in Indonesia.

II. Literature Review

A. Electronic Commerce Payment System

Financial needs have been created as the result of the advanced development of e-commerce. The traditional payment systems cannot effectively fulfill the e-commerce user needs anymore. Therefore, some technology developer starts to create some electronic payment systems in order solve this problem issue. An electronic payment system is defined as any type of payment methods that use Information and Communications Technology (ICT), including cryptography and telecommunication networks [5]. The most popular form of online payment that people used in the world is credit card [6], [7]. As globally, bank transfer is still second popular as online payment method. However, in North America, online payment gateway providers like PayPal become as second popular of online payment method [7]. It seems like in some developed countries, the use of online payment gateway providers or payment mediates already common. The reason might be there are many merchants use payment gateway as their payment method. Moreover, the infrastructure on those countries is better compare with some developing country. For instance, in OECD countries, the government creates a regulation in order to make a good security culture to protect internet business which has great potential threats in security [8].

In Indonesia, the users still have low experience through kind of online payment method. As the recent survey [2], the usage of online payment as the payment method was very low. It can be seen from the diagram after, bank transfer still leads the users' payment method in Indonesia.

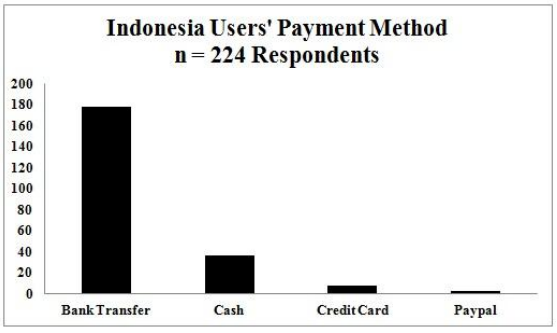

Fig. 1. Indonesia users' payment method [2].

Moreover, in Indonesia, people see that the only solution for doing online payment is via bank transfers by using e-banking or atm. The reasons why people in Indonesia tend to use bank transfer are the speed of transaction process, easily found, and trust. Furthermore, we can not only see from user point of view only, in merchant point of view, it is understood that there are still few of merchants provide certain type of online payment regarding they do not have infrastructure of online payment system. Moreover, people in Indonesia feel the security in bank is better rather than other kind of payment providers. Indonesia people should be educated and given more information on existing payment methods. Furthermore, it seems like an opportunity for payment gateway providers to share information due to the lack of knowledge from users and merchants of e-commerce in Indonesia about benefits of using infrastructure that is granted by adopting Online Payment Gateway.

The following is flow of online payment gateway based on author analysis combined with one journal [9]:

1) Customer visits the website and click check out button as initiation to buy and request payment.
2) After receiving message from customer, merchant's web/server makes digital order includes customer IP and transaction amount. Merchant also adds digital certificate as identifier of their store. The digital order sends to the payment gateway through secure network with data encryption.
3) Based on the digital certificate, payment gateway will verify the store.
4) Payment gateway will offer various payment methods to the payment page in customer browser.
5) Buyer will choose type of payment method, and it will be directly transmitted to payment gateway through secure network.
6) Payment gateway will process the payment by sending the payment details to the acquiring bank.
7) Acquiring bank will authorize and confirm the payment if there is no rejection. Afterward, the acquiring bank will send confirmation to the payment gateway
8) Payment gateway will notify the merchants about acceptance of the payment in form of digital receipt.
9) Payment gateway will also notify the customer with digital receipt in result page.
10) Customer may continue shopping

B. The Unified Theory of Acceptance and Use of Technology

A various model and theory of user acceptance have been created in recent years. Recently, V. Venkatesh, Michael G. Morris, Gordon B. Davis, and D. Davis (2003) reviewed and compared eight models and theories with longitudinal field studies. The theories include TRA, TAM, Motivational Model (MM), TPB, model Combining of TAM and TPB (C-TAM-TPB), MPCU, Innovation Diffusion Theory (IDT), and Social Cognitive Theory (SCT) [10]. This theory and model was named as the Unified Theory of Acceptance and Use of Technology (UTAUT) [10]. This theory was consolidated from important core construct in eight theories. In this theory, Venkatesh et al created four cores construct which are Performance Expectancy (PE), Effort Expectancy

(EE), Social Influence (SI), and Facilitating Conditions (FC). This theory also has four moderating variable which are Gender, Age, Experience, and Voluntariness of Use.

The first core construct of UTAUT is Performance Expectancy. Performance Expectancy is defined as the degree to which and individual believes that using the systems will help him or her to gains in job performance [10]. Afterwards, the second core construct is Effort Expectancy. This construct refers to the degree of ease associated with the use of the systems [10]. The next core construct from UTAUT is Social Influence. This construct is defined as the degree to which an individual perceives that important others believe he or she should use the new system [10]. The last determinants of UTAUT is Facilitating Conditions, this determinant have a meaning which is the degree to which individual believes that an organizational and technical infrastructure exist to support use of the system [10].

C. Costs and Security

From previous research similar with this research about merchants' adoption toward mobile payment [11], it is understood that Costs is also becoming considerable for merchants to adopt a new payment system in their firm. Although, the research is slightly different to the adoption mobile payment, we believe that it still can be included and have related with electronic payment systems as well as Online Payment Gateway. Furthermore, from our observation in some Online Payment Gateway websites, it is concluded that Online Payment Gateway also charges some fee such as initial set-up fee, maintenance fee, and also transaction fee in various fee structure. In addition, every payment gateways have different way of commercial rate structure. Other journal also includes that merchants expect get benefits that comparable with costs [12]. Therefore, we include costs as important role to drive the merchants' intention to adopt online payment gateway.

The use of online payment system for e-commerce cannot be inevitability from security. Therefore, it is found that security has correlation with intention to adopt a new technology especially electronic payment system. Previously, a research from Fang He and Peter P. Mykytyn (2007) examined and concluded that people consider the risks related to making online payments. Furthermore, a customer will more likely to adopt online method if the transaction is secure [13]. As well as customer, it is believed that merchants also have same thought and consideration regarding the security issue. There are two dimensions of security. First dimension of security is about protection by government. As already stated in journal about online payment gateway [9], role of government is initiating the regulation in order to ensure the security. Moreover, some developed countries are succeeding to encourage the users and merchants to utilize online payment gateway because the government succeeds to create security environment towards online payment gateway [8]. If merchants feel that is lack of protection by government for online transaction, they may be less desire to do adopt online payment gateway as their payment infrastructure. Second dimension is about concern about system and web security. One journal states that in China, payment gateway still cannot fulfill the merchants' demand due to lack of secure mechanism [14]. Therefore, in Indonesia system security is also considered as lack of secure mechanism due to infrastructure. As the result, system security may be included as determinants for merchants' intention to adopt online payment gateway in Indonesia.

III. Research Method

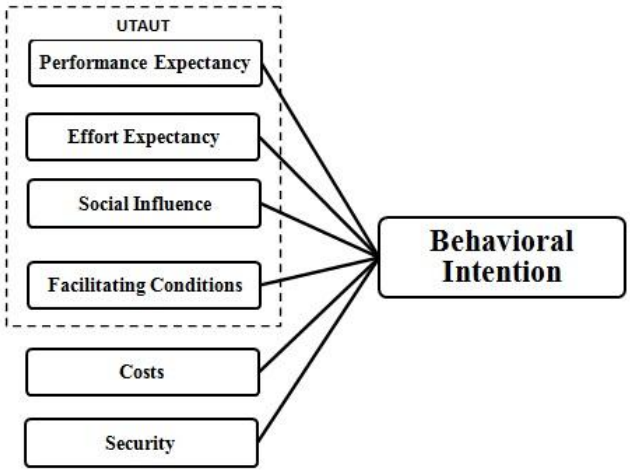

Fig. 2. Research framework.

In this research, survey-based questionnaires will be employed as a method of data collection. Data was collected through online and paper questionnaires. There are 77 respondents who are the e-commerce companies and the majority of them are established more than 6 months and selling products rather than service. Based on the number of employees, most of them have around 1 – 4 employees with annual gross income less than IDR 300,000,000 (USD 30,000) and asset less than IDR 50,000,000.

There are six hypothesis employed to find evidence on the relationship among the variables in the proposed model. These hypotheses are:

H1: Performance Expectancy is affecting Merchant's Behavioral Intention toward Online Payment Gateway in Indonesia

H2: Effort Expectancy is affecting Merchant's Behavioral Intention toward Online Payment Gateway in Indonesia

H3: Social Influence is affecting Merchant's Behavioral Intention toward Online Payment Gateway in Indonesia

H4: Facilitating Condition is affecting Merchant's Behavioral Intention toward Online Payment Gateway in Indonesia

H5: Cost is affecting Merchant's Behavioral Intention toward Online Payment Gateway in Indonesia

H6: Security is affecting Merchant's Behavioral Intention toward Online Payment Gateway in Indonesia

To assess the reliability and validity, the internal consistency reliability (ά coefficient) of the four factors were calculated. The *Cronbach's alpha* all exceed the recommended level of 0.7 for *Cronbach's alpha* [15]. To check the validity of the instrument, all corrected item total correlation were calculated and the values are all greater than 0.22. The corrected item total correlation ranges from 0.49 (an item in Social Influence) to 0.96 (items in Facilitating Condition).

TABLE I: REGRESSION RESULTS.

Hypothesis	R-sq	Adj R-sq	F	p
H1: PE to BI	0.262	0.252	26.645	p<0.05
H2: EE to BI	0.164	0.153	14.728	p<0.05
H3: SI to BI	0.229	0.219	22.334	p<0.05
H4: FC to BI	0.194	0.184	18.084	p<0.05
H5: C to BI	0.045	0.033	3.566	p>0.05
H6: S to BI	0.119	0.107	10.129	p<0.05

The *adjusted R square* is to identify the correlation of the independent variable with dependent variable. From Table 1, the *adjusted R square* of relationship between performance expectancy and Behavior Intention is 0.252, implying that 25.2% of behavior intention to use online payment gateway in Indonesia is accounted for by the performance expectancy. The *p-value* is less than 0.05, indicating strong evidence that performance expectancy will influence users to have intention in using online payment gateway.

For H2 that hypothesizes relationship between Effort Expectancy and Behavior Intention is based on *adjusted R Square*, 15.3% of behavior intention can be explained by Effort Expectancy. Again, the *p-value* is less than 0.05, indicating a significance relationship between effort expectancy and behavior intention to use online payment gateway.

Likewise, H3 (social influence and behavior intention) is also supported as the *p-value* is less than 0.05. Again, this indicates a strong relationship between social influence and behavior intention. In this relationship, 21.9% respondents agree that behavior intention is influenced by social influence.

For H4 (facilitating condition and behavior intention): *p-value* less than 0.05 indicates a significant relationship between facilitating condition to behavior intention. A proportion of respondents (18.4%) agree that facilitating condition is influencing behavior intention.

For H5 (cost and behavior intention), the p-value is greater than 0.05. Therefore, it can be concluded that cost and behavior intention do not have any relationship.

Lastly, for H6, the hypothesized relationship between security and behavior intention confirmed as the *p-value* is less than 0.005. The *adjusted R square* is 0.107, meaning 10.7% of the respondents believe that behavior intention is influenced by security of online payment gateway in Indonesia.

IV. CONCLUSION

The aim of this research is to identify the correlation between UTAUT determinants which are Performance Expectancy, Effort Expectancy, Social Influence, and Facilitating Conditions with merchants' intention to adopt Online Payment Gateway in Indonesia. In conclusion, it is found that these four determinants have correlation with the merchant's intention toward using the Online Payment Gateway. However, among those two additional variables, only Securities can determine the merchants' intention to adopt Online Payment Gateway in Indonesia.

As the result, this research produces the final framework as fig. 3 below:

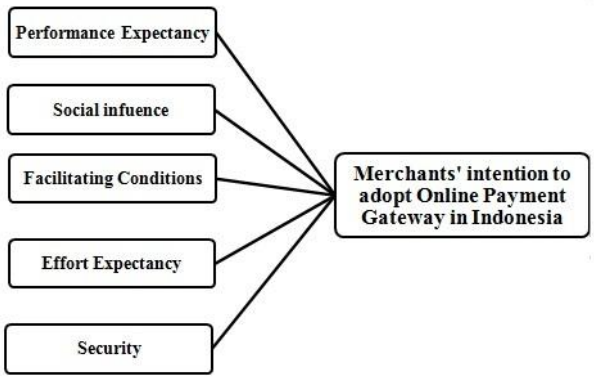

Fig. 3. Final aramework.

Moreover, refer to *F value* on table 1; most of the respondents agree that Performance Expectancy is the most important factor. Previous researches, related to electronic payment and internet banking, also supports that Performance Expectancy as an essential factor for adoption [16]. The most prominent finding in this research is about Social Influence. As we can see in table 1, the *F value* of Social Influence is the 2nd importance factor. The reason this might happen is because Asia has high collectivist cultures compare with western country. This statement is noted by Hofstede in his research about social values toward different culture [17]. In addition, based on the questionnaire, it concludes that many famous banks and merchants that has partnered with online payment gateway become consideration for intention to adopt. Moreover, suggestion from other owner or developer of e-commerce merchant to use online payment gateway will influence the other merchants. The other UTAUT determinants which are Facilitating Conditions and Effort Expectancy are considered as rank 3 and 4 accordingly. These two factors are not really crucial because merchant's role in online payment gateway only as users. The online payment gateway providers should ensure the infrastructure ease to use for their clients which in this case are merchants. However, online payment gateway providers also should make several clear procedures for facilitating the clients if the errors might occur. Therefore, both Effort Expectancy and Facilitating Condition might more liable on behalf payment gateway providers. Although security becomes the least important factors, security is considered as crucial determinants. Moreover, based on from previous report, security always becomes consideration in e-commerce area [18]. Furthermore, two dimensions of security have important role in order creating secure environment. Those dimensions are government policy and security mechanism of website and network. Based on research finding, it is concluded that merchants' require a clear regulation and policy in Indonesia due to make the secure environment. Moreover, merchants' also consider the website and network of online payment gateway providers should be secured with several protections to minimize criminal. Surprisingly, one of determinant, cost is rejected from the framework. The reason cost is excluded from the framework perhaps merchants do not consider cost as the important component for intention. Because merchants are not aware yet about cost before they start to set up the Online

Payment Gateway. Although based on this research, cost is excluded, one of our respondents said that in some industries (especially information technology or computer component) the seller only earns small profit margin from the sales of products. Therefore, if the payment gateway charges a huge fee, the sellers would suffer loss every time. Thus, they consider cost is an important factor.

This paper perhaps has enlightened and augmented our knowledge of e-commerce sector especially about Online Payment Gateway in Indonesia. As it can be understood, this research has several limitations. The research for finding other factors regarding intention of merchants' toward adoption of Online Payment Gateway in Indonesia should be conducted since this research only used six independent variables.

Although cost is excluded from the framework, cost is still an important determinant which many research authors related to adoption of electronic payment systems have examined before. Furthermore, it is recommended to also conduct Qualitative Research to support the quantitative data. By using Qualitative Research, other factors related merchants' intention to adopt Online Payment Gateway might be found. Because there are some factors that can be aroused from various happening in this world about intention of Online Payment Gateway.

Finally, further advanced research should be conducted related with information systems and technology, specifically in e-commerce, because this area still conceals many kind of knowledge that can improve the way of our living.

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